MICHIGAN STATE UNIVERSITY ANEMOMETHER LOAN PROGRAM

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INTRODUCTION

- **Program was initiate by a modest grant ($15,000) from the Department of Energy's Midwest Regional Office through the State Energy Office**
  - For small wind to grow in Michigan, better information is needed
  - Allowed for the purchase of 6 anemometer systems
- **The focus of the anemometer loan program is:**
  - Agriculture or agriculturally related businesses
  - Small wind systems
- **Project co-investigators**
  - Dr. Stephen Harsh, Agricultural Economic, MSU
  - Dr. David Johnson, Fisheries and Wildlife, MSU
  - Dr. Lynn Hamilton, MSU (visiting faculty member)
- **Grant administrator**
  - James Bardenhagen, MSU-Extension, Leelanau County

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(Introduction Continued)

- **Initial program was augmented by two additional grants**
  - Both related to the greenhouse industry
  - One very broad in terms of energy focus and the other is focused on wind
  - Added 4 additional anemometers systems
- **Current cost of operations is covered by a grant for the Michigan Energy Office**

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SYSTEM DETAILS

- **Original plan was to purchase eight 20-meter systems**
  - Many expressed a desire for the project to purchase taller towers
- **Actually ordered six NRG 30-Meter-Wind Explorer complete systems**
  - 30 meter tower (guy-wired, steel-tube style)
  - Anemometer with wind direction vane & temperature gauge
  - Data logger
  - Software package to download data from the data plugs
  - Installation kit (gin pole, etc.)
- **Eight systems have been delivered and installed**
- **The other 2 systems should be installed by the end of the year**

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LOAN PROGRAM DETAILS

- **Used an application process to select participants**
- **The nature of the loan program was widely advertised**
  - New releases
  - Radio programs (including live interviews)
  - Extension channels
  - Meeting with interested groups
  - Word of mouth
  - MSU Wind Energy web-site
  - Feature articles in newspapers
- **Application form and loan program information was made available to many**
  - Downloadable from the web-site
  - Handouts at meetings
  - Personal letters

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(Loan Program Details Continued)

- **Information requested on the application form**
  - Standard information (name, address, telephone, acres, etc)
  - Size and nature of their business, including amount of electricity used in the business
  - Details regarding how a wind turbine might be used in their operation
  - Description of their site
  - Diagram of where they would locate the system
  - If they have checked on possible zoning restrictions
  - Other information that might be important in considering their application

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(Loan Program Details Continued)

- **More than 40 firms applied for the program**
- **Selection process**
  - Done by a committee of 6
  - It was a two stage process (do a "first-cut" selection process and then gather additional information; based upon the additional information make the final selection)
  - Criteria used by the selection committee
    - **Geographic balance**
    - **Potential power savings**
    - **Strength of the proposal**
    - **Visibility (e.g., learning center or high traffic business)**
    - **Attributes of site (no wind obstacles, zoning, etc)**

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(Loan Program Details Continued)

- **Those selected:**
  - Proposed a good use of wind power
  - Appeared to have a good location
  - Reflected some diversity in location and type of agricultural operation
    - **Beef, pork, dairy, greenhouse and fruit operations and research and educational centers**
- **Before installation a legal contract needed to be signed**

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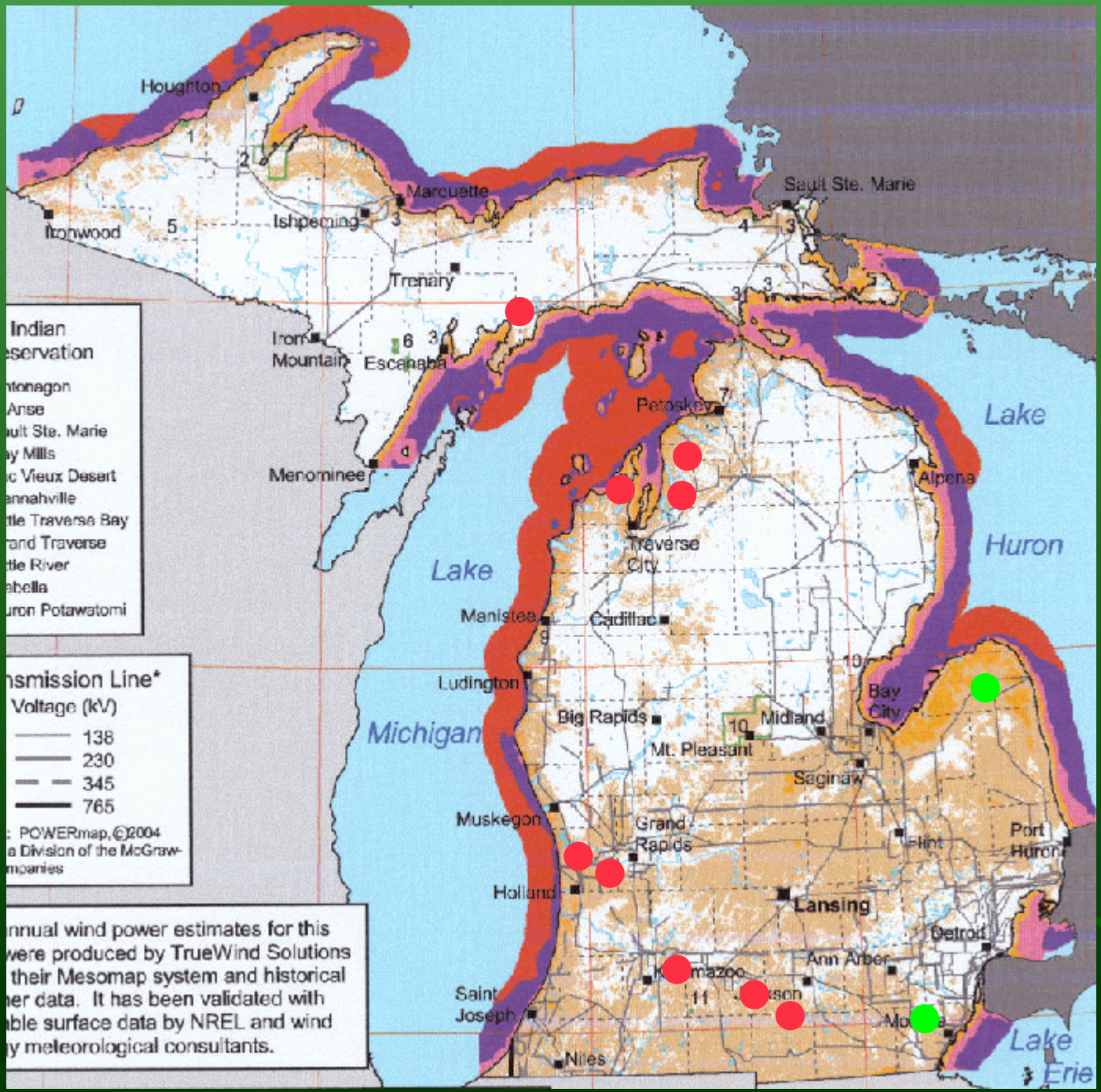

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Attaching the Meters

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Tilt-up with Gin Pole and Winch

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Anemometer Tower Installed

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Data Logger

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DATA COLLECTED

- The data logger takes measurements every few seconds, averages the readings and stores the data on 10 minute intervals
  - Wind speed
  - Temperature
  - Wind direction
- Software creates several different charts and tables

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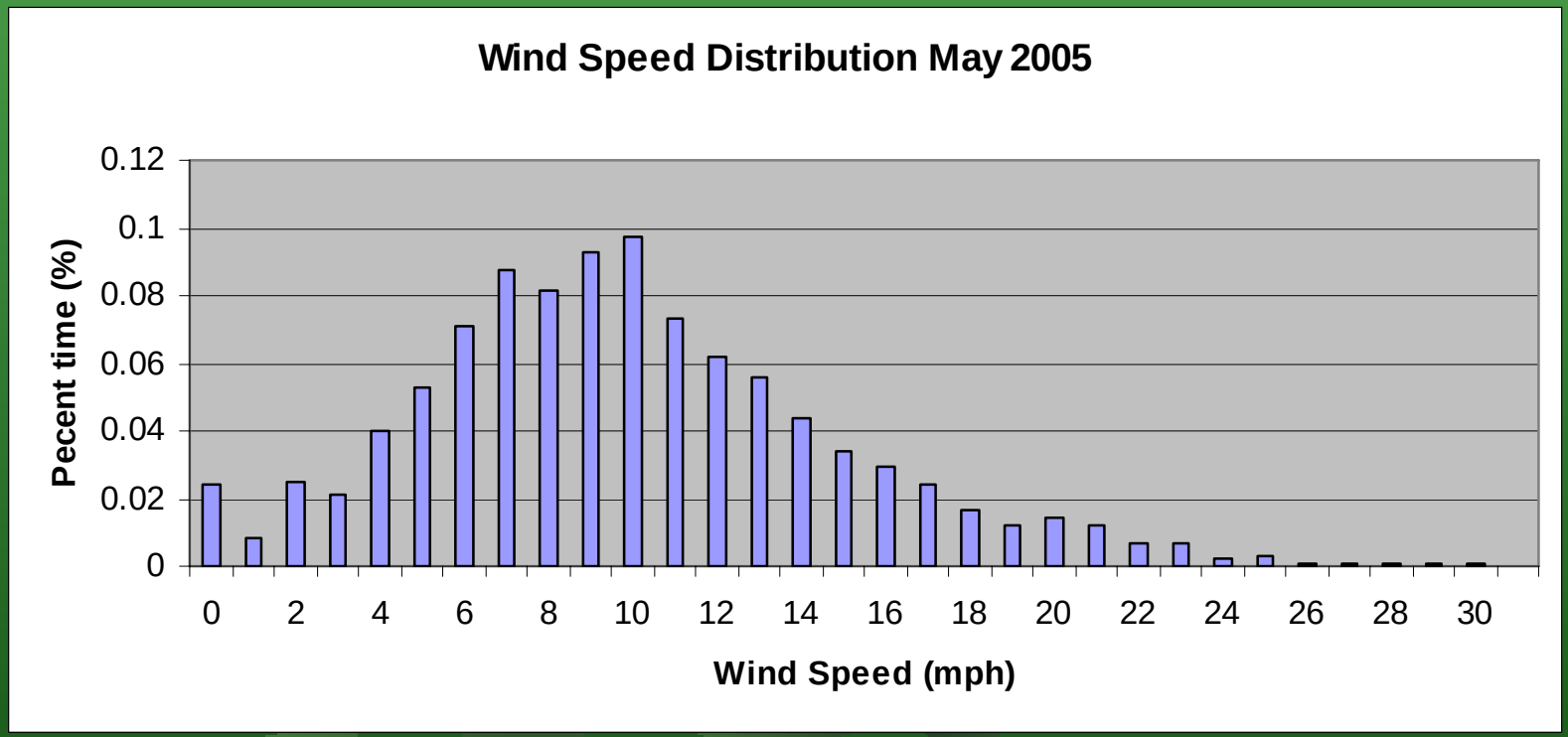

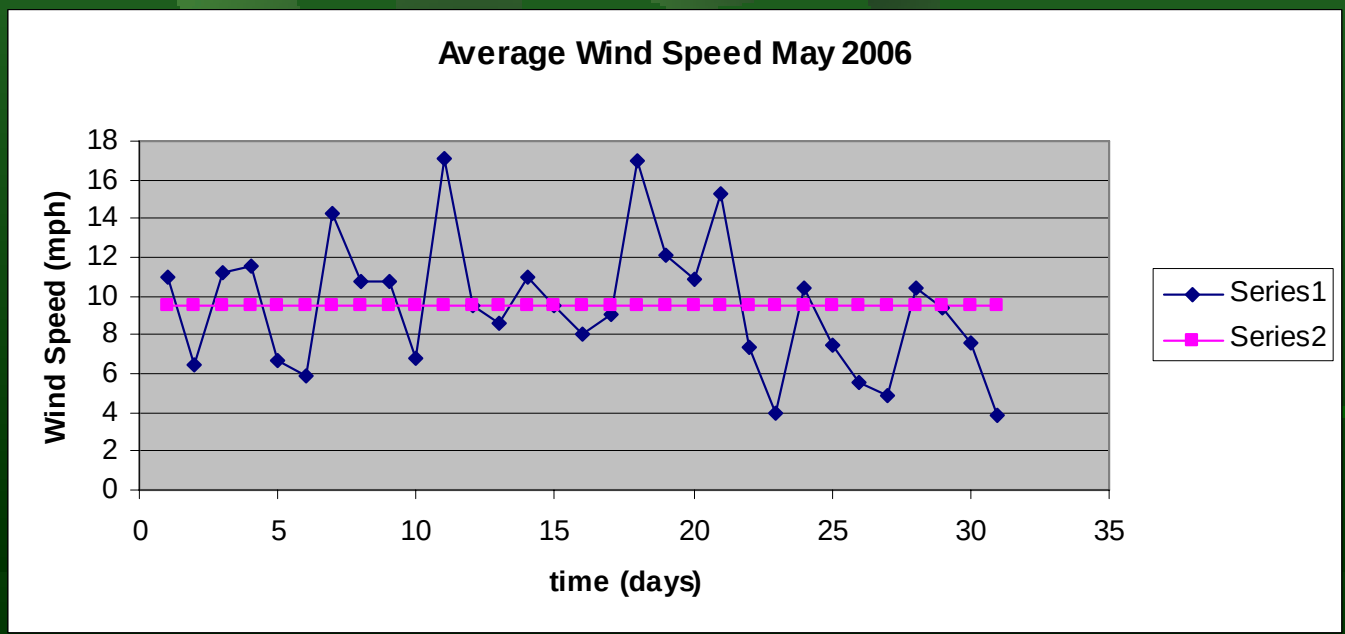

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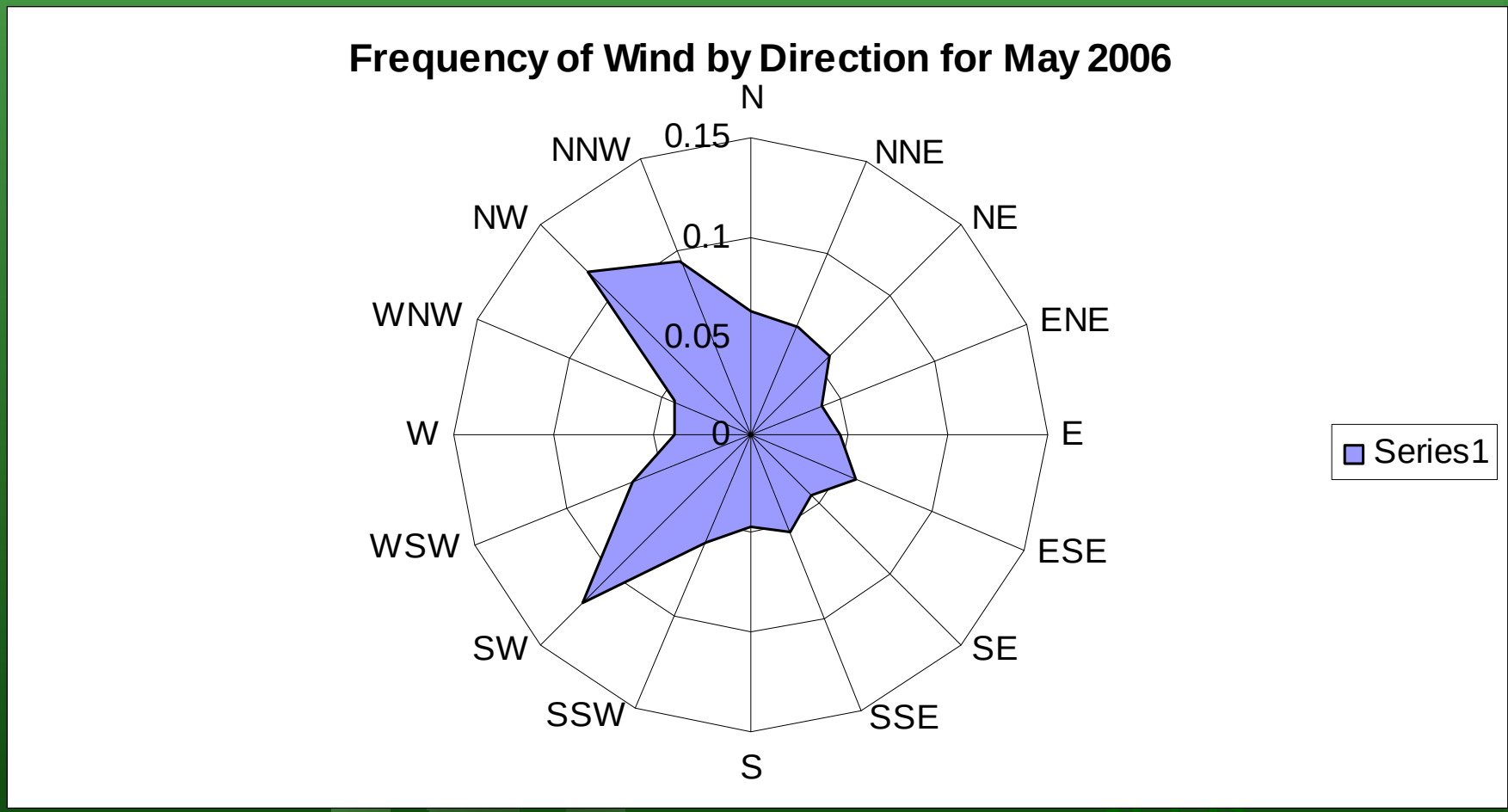

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DATA USE AND ANALYSIS

- **Data from the anemometers will be analyzed by the Energy Investment Decision Model (with wind power interface)**
  - Uses capital budgeting methods
  - Takes into account the tax implications and grant opportunities
  - Addresses net metering regulations
  - Focuses on energy savings
  - Designed to operate under different energy situation scenarios

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(Data Use and Analysis Continued)

- **Data availability**
  - The graphics and summary data will be made available on the MSU Wind Power web-site for each of the anemometer locations
  - Raw data will be stored in a database system
    - **Access available to others upon formal request**

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PROGRAM FUTURE

- **The application process will be repeated next year**
  - Systems will be moved to new sites
- **Operational support for next year will come from a new grant from the Michigan Energy Office**
  - Plans are to make this a transition year with much of support being passed onto the users of the systems
- **We are excited about the program and the way it can help promote wind power in Michigan**

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